

Strengthening bonds and connecting with followers

A biobehavioral inventory of political smiles

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ABSTRACT. The smiles and affiliative expressions of presidential candidates are important for political success, allowing contenders to nonverbally connect with potential supporters and bond with followers. Smiles, however, are not unitary displays; they are multifaceted in composition and signaling intent due to variations in performance. With this in mind, we examine the composition and perception of smiling behavior by Republican presidential candidates during the 2012 preprimary period. In this paper we review literature concerning different smile types and the muscular movements that compose them from a biobehavioral perspective. We then analyze smiles expressed by Republican presidential candidates early in the 2012 primary season by coding facial muscle activity at the microlevel using the Facial Action Coding System (FACS) to produce an inventory of politically relevant smile types. To validate the subtle observed differences between smile types, we show viewers a series of short video clips to differentiate displays on the basis of their perceived reassurance, or social signaling. The discussion considers the implications of our findings in relation to political evaluation and communication efficacy.

Key words: Nonverbal communication, social signaling, facial displays, smiles, happiness/reassurance displays, FACS coding, 2012 presidential election

Mediated events, including televised debates, campaign speeches, and candidate forums, have assumed an unrivaled position as a vivid and effective means by which politicians communicate with followers, particularly during the formative stages of presidential campaigns. In these rhetorical settings, the verbal messages of candidates are either enhanced or diminished by their nonverbal delivery—and further intensified by televised close-ups and repeated, high-definition display in news reports and online videos. When vying for dominance, candidates for high office must address three imperatives pervasive through all social interactions. First, they must reliably communicate their social motives and affective dispositions. Second, they are tasked with influencing audiences through the display of contextually appropri-

ate signals. Third, for damage control purposes there is a need to regulate spontaneous (i.e., unplanned or inappropriate) displays that could be detrimental to their image. Beyond the words spoken, these nonverbal strategies are crucial for effective self-presentation, projecting political leadership, and bonding with voters.

Recognition of the importance of nonverbal self-presentation by public figures extends at least as far back as Aristotle.¹ In the modern era, the rise of television as the primary medium of political information and expression, especially the Kennedy-Nixon debates of 1960,² pushed the importance of candidate behavior front-and-center. Ronald Reagan's training as a film and television actor made his political communication style particularly interesting to investigate, and during his presidency the systematic observational and experimental analysis of nonverbal leader displays gained momentum.³ In particular, important strides in nonverbally focused research were made by an interdisciplinary team of investigators at Dartmouth College, who utilized ethological analysis, neuroscientific

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principles, and evolutionary psychology to elaborate a framework for systematically observing social and political nonverbal behavior.⁴

Through a series of visual analyses and experimental studies examining political display behavior, research from this era documented the prevalence and consequences of three general facial display configurations central to social (and political) interaction—happiness/reassurance, anger/threat, and fear/evasion^{5,6,7} with a fourth display type, sadness/appeasement, elaborated later.⁸ While each of these expressive configurations is consequential for leader-follower communication, happiness/reassurance and anger/threat are especially implicated in the ability of candidates to capture the attention of viewers and dominate rivals. As studies of the “happy warrior” style of leadership have shown,^{9,10} happiness/reassurance displays have special resonance in American politics because they indicate an affiliative and egalitarian approach to leadership.^{11,12}

By contrast, anger/threat displays signal a competitive or agonistic form of interaction and are routinely used by politicians to intimidate opponents and rally core supporters, although responses to nonverbal communication may vary somewhat depending on the cultural context.¹³ The display of fear/evasion, on the other hand, is counter-productive to the assertion of leadership qualities.¹⁴ And, although a certain amount of sadness/appeasement may be expected during times of national mourning or salutes to fallen heroes or innocent victims,¹⁵ these displays are not typically associated with leadership and rarely surface in competitive contexts.

Mounting evidence of the influence of nonverbal communication behavior, combined with continuous news coverage of politics and ready access to video images of candidates through television and digital media, arguably enhance the emotional impact of nonverbal cues, especially facial displays, which are important for electoral success.¹⁶ Precision coding of facial displays using Ekman and Friesen’s Facial Action Coding System, also known as FACS,^{17,18} has advanced our understanding of the role of expressive display behavior on perceptions of leadership. Theoretical developments in this area suggest that facial displays are not just prototypical readouts of internal states, as posited by Basic Emotion Theory, but can be seen as “dynamically emerging response patterns resulting from a series of evaluative appraisals.”¹⁹ In other words, the way that facial displays are performed (and interpreted) may

differ based on the social ecology of a communication setting—and the communicator’s appraisal of the situation.^{20,21} The Componential Processing Model of emotion appraisal suggests that while facial movements co-occur in clusters, there is a good deal of variability in their performance, reflecting the inherent complexity of social situations in which facial displays are adaptive, as well as the characteristics and personality traits of the communicator.^{22,23}

In light of these considerations, we ascertain whether the greater specificity suggested by the emotional and ethological literature is warranted in political communication by showing how different smiles are performed in the context of presidential campaign speeches, where putative leaders possess the audience’s attention but not necessarily their support. We thus explore the actual performance of smiles in a naturalistic environment as well as how they are observed and evaluated in a more controlled setting. This two-step evaluation allows us to not only appraise whether there is variance in smile performance, but also whether the *variation* in smile types influences the interpretation of their emotional content. Here we understand emotional signals as complex and multifaceted information communicated by the face, which is interpreted as conveying affect and predicting behavioral intent.²³

This article first reviews the literature concerning different smile types that may be used as social signals in the competition for political leadership. We next analyze the facial displays of ten Republican presidential candidates recorded during the early (preprimary) stages of the 2012 presidential election to identify the range of affiliative expressions communicated to voters, producing an inventory of politically relevant smile types. Using the Dartmouth Group’s definition of happiness/reassurance displays, we select two video clips per candidate—one as an example of a prototypical happiness/reassurance display and the other as diverging from the prototype. This provides us the opportunity to evaluate smile variability. Next, coding of these clips was performed on a frame-by-frame basis using FACS to accurately characterize these displays as specific smile types identified in the literature. We then asked study participants to evaluate these short videos in terms of perceived emotions the candidates were seen as feeling in order to discriminate between the different smile types. We conclude by discussing how even subtle variations in smile morphology influences how individuals may interpret the nonverbal behavior of political figures.

Unpacking happiness/reassurance displays into different smile types

Happiness/reassurance displays are important for harmonious interaction in all social primates where dominance interactions are present, especially instances of postconflict reconciliation and consolation.^{25,26} Among other functions, happiness/reassurance displays allow individuals to engage in strategies to build and strengthen social connections.^{27,28} Different smile types perform unique functions in social interaction,²⁹ both by those encoding the displays and those decoding the smiles. “Enjoyment” smiles that engage both lip corners (pulling up and at an angle while the eyes are constricted), for instance, regulate and promote cooperative relationships by advertising nonthreatening intentions.^{30,31,32,33,34} Likewise, individuals who have been socially rejected tend to do a better job of distinguishing between smiles with varying social intent³⁵ and prefer smiles signaling affiliation.³⁶ Taken together, the range of different smiles and associated emotional displays play an important role in group bonding and social cooperation.

In the political arena, televised leader displays play a pivotal role in attaining and maintaining the support of followers, who are more likely than opponents to respond positively to and emulate displays of happiness/reassurance.^{37,38,39} However, beyond varying the emotional intensity of happiness/reassurance displays,^{40,41} there have been few attempts to elaborate the richness and nuance of smiles by political figures. Recently, Stewart and Dowe found that viewers discriminate between different happiness/reassurance displays based on whether smile controls—facial movements that dampen the intensity of smiles⁴²—are evident in the expression and whether the mouth is relaxed or opened.⁴³ This suggests that smiles may be differentiated on the basis of subtle configural changes that influence interpretation and response. Consistent with these findings, there is a great deal of variation in how smiles are displayed and interpreted. We next explore the elements of different smile “phenotypes” (observable characteristics) and how they can be reliably differentiated.

The variety in observed smile phenotypes among nonpoliticians has intrigued researchers for decades with several taxonomies of smiles proposed in attempts to bring order to this diversity of expression.^{44,45,46} Likewise, researchers have postulated different emotional bases and social functions for each smile type

observed.^{47,48,49} Mehu and N’Diaye underlined the importance of considering different levels of ethological explanation to avoid confusion between the proximal factors that influence smiling (e.g., emotional experience and social circumstances) and the ultimate—or evolutionary—function(s) that smiles serve.^{50,51}

According to this view, smiles should vary in relation to the social context in which they are observed—and have different consequences for observers based upon the appropriateness of the display.^{52,53} Therefore, what defines a smile category is the stability of association between a smile’s proximal causes, its morphology (i.e., structure and form), and functional consequences. In the next section we review the psychological literature on smiles, which distinguishes between the five different kinds of expressions identified and evaluated in this study: posed, enjoyment, amusement, controlled, and contempt smiles. (Fear smiles, in which the lips are pulled straight back, are also an important part of politics that signal submission and have been observed in competitive contexts such as political debates,^{54,55} but we did not expect to observe them in speeches to supportive audiences that serve as the basis of our stimuli, so they are not included in the present study.)

Different smile types may be identified on the basis of morphological characteristics of the face, including the direction of lip corner pull, muscular “controls” in the lower face that influence the shape of the mouth and extent of its opening, and coactivation of the *orbicularis oculi* muscles surrounding the eyes. In addition, the timing, duration, and symmetry of displays distinguish between smile types.^{56,57} In their classic work, Ekman and Friesen identified multiple smile types using their Facial Action Coding System to classify muscular actions and judged intensity of facial movements.⁵⁸

The first, most pertinent signal is the pulling of lip corners, prototypically up and at an angle (what FACS coding specifies as Action Unit [AU] 12), by the *zygomatic* muscle. Other facial movements may also be present, enhancing the signal quality of the display. At the same time, these movements may dampen the quality of the emotion signaled if they are blended or associated with other emotional states⁵⁹—a nonhomogenous display characterized by expressive “leakage.” The different forms that smiles take likely reflect the communicator’s evaluation of the social situation. This expressive performance, in turn, can be expected to affect the unfolding social circumstances.

The proximal mechanisms underlying the production of smile components are still poorly understood.

Table 1. Smile types and definitions.

Smile type	Defining FACS Action Units (AU)	Description
Posed (also nonfelt or false)	AU 12	<i>Lip corners pulled up and at an angle only</i>
Enjoyment (also felt, Duchenne or true)	AU 12 + AU 6	Lip corners pulled up and at an angle + <i>muscles surrounding the eyes contracted</i>
Amusement (also relaxed open mouth)	AU 12 + AU 6 + AU 25/26/27	Lip corners pulled up and at an angle + muscles surrounding the eyes contracted + <i>teeth are revealed and the jaw is relaxed/dropped/pulled apart</i>
Controlled	AU 12 (+ AU 6 + AU 25/26/27) + AU 15/17/23/24	Lip corners pulled up and at an angle + muscles surrounding the eyes are contracted + teeth are revealed and the jaw is relaxed/dropped/pulled apart + <i>lips are restrained by the corners being tightened/the corners pulled downward/the lower lip being pressed up/the lips tightened or pressed together</i>
Contempt	R/L AU12 + R/L AU 14	<i>Lip corner on one side pulled up and at an angle + lip corner on that side tightened</i>

Note: Key muscle movements in italics.

From an appraisal perspective it is believed that their activation results from cognitive evaluations of social situations in terms of relevance, implications, coping potential, and norm compatibility.⁶⁰ The complex configurations of facial movements in emotional expressions would therefore result from sequential evaluations of a given situation, appraisals that would call for specific action tendencies and communicative demands. Activation of the *orbicularis oculi* muscle (AU6), for example, may be the most common facial component associated with smiling and could reflect the pleasantness of an emotional experience⁶¹ as well as its intensity and authenticity.^{62,63,64}

Posed smiles

Posed smiles, also known as false or nonfelt smiles, are defined as occurring when an individual attempts to either signal positive emotion when it is not felt (phony smile) or when a smile is used to conceal a negative emotion (masking smile).⁶⁵ In both cases, the muscles surrounding the eyes, the *orbicularis oculi*, are generally not contracted (see Table 1). Likewise, Ekman and Friesen posit that “miserable smiles” occur when posed smiles are superimposed upon discernibly negative emotions, such as anger, fear, or disgust, most likely in an attempt to hide them.^{66,67}

According to Ekman,⁶⁸ posed smiles function as multipurpose social lubricants which, when combined with other facial display and body language movements, can serve a variety of signaling roles. Among other functions, posed smiles have been associated with a wide range of emotional and communicative states, including misery, embarrassment, and flirtation as well as compliance and coordination. Regardless of the role that posed

smiles play, observers are not only more sensitive to differences between authentic (e.g., enjoyment) and posed smiles,^{69,70} they are also quite capable of differentiating between different smile types.⁷¹

Enjoyment smiles

In addition to contraction of the *zygomatic* muscle (AU 12), the authenticity of expressed emotion is thus in part based on the presence or absence of activity in the upper face, particularly contractions of *orbicularis oculi* muscles (AUs 6 and 7), which regulate the eye aperture and reinforce whether the smile was “felt” by the communicator. The enjoyment (or “Duchenne”) smile has been one of the most extensively studied facial displays, with work beginning in the nineteenth century by Duchenne de Boulogne⁷² after whom this smile is named. Not surprisingly, enjoyment smiles have been strongly associated with feelings of amusement and happiness,⁷³ as well as behaviors concerning approach and cooperation.^{74,75,76} Indeed, the mere act of expressing such a smile might lead to a more positive physiological and psychological state due to “facial feedback.”⁷⁷

In a comparison of posed smiles with spontaneous felt smiles, Schmidt and colleagues found no significant differences in the occurrence of muscle contraction around the eyes (*orbicularis oculi*, AU 6).⁷⁸ This finding was potentially due to the lower intensity of the spontaneous smiles studied, and thus the *zygomatic* muscle not contracting hard enough to enervate the *orbicularis oculi*, as was the case with the posed smiles they examined. It is unclear whether coactivation of the *zygomaticus major* and *orbicularis oculi* muscles is provoked by the activation of the former, or whether

the strong action of the *zygomaticus major* produces the same appearance changes as the action of *orbicularis oculi* (without activation of the latter). Both options are possible, and recent evidence shows that the activation of both are tightly correlated.⁷⁹ Even so, posed smiles might not be as strongly associated with the felt emotional states of enjoyment and happiness as enjoyment smiles.

Amusement smiles

The amusement smile may be seen as one of the more fundamental facial displays in the evolution of social signaling, as documented in research with both humans and nonhuman primates.^{80,81} A loose jaw or relaxed open mouth is a key characteristic of an amusement smile.^{82,83} Here, we see that action in the lower face, in addition to the lip corner pull of the *zygomatic* muscle, may accentuate the signal quality of the smile beyond that of enjoyment. For instance, when the lips part (AU 25), often revealing teeth, and the mouth aperture is loose (AU 26) or dropped open (AU 27), the signal of positive intent by these smiles increases (see Table 1). Furthermore, the slight shaking of the body with its forced exhalation of air due to laughter has the potential to communicate prosocial intent, especially as this display behavior is strongly related to feeling high levels of playful exhilaration.^{84,85}

Socially, amusement smiles can be best understood as indicators of egalitarian relations between individuals. Mehu and colleagues found in an observational study that young adult males are more likely to display amusement through smiles and laughter when interacting with other males their own age than with those who are older and, presumably, have greater status.⁸⁶ Likewise, Stewart found an association between in-group focused humor and amusement-linked display behavior during the 2008 U.S. presidential primary debates, suggesting that even in competitive political contexts, amusement smiles can serve an important signaling purpose in dampening aggression and providing a means by which even fierce competitors may engage in ritualized bonding.^{87,88}

Controlled smiles

Controlled smiles, in which candidates attempt to constrain the extent of their amusement or self-satisfaction in response to audience laughter or applause, occur when an individual attempts to dampen (or, at times, exaggerate) the power of a display. In such cases, smile controls such as the chin raiser (AU 17),

dimpler (AU 14), lip corner depressor (AU 15), lip tightener, (AU 23) or lip presser (AU 24), may diminish the signaling quality of the *zygomatic* muscle and, potentially, the *orbicularis oculi* muscles surrounding the eyes. This may be due to the association of each of these lower facial action units with negative emotion displays, including anger (AU 15, AU 17, AU 23 and AU 24), sadness (AU 15 and AU 17), and disgust (AU 17)—and dampened social signals as a result.⁸⁹

In a study analyzing the smile repertoire of President Barack Obama, Stewart and Dowe found that displays engaging these lower face muscular controls diminished viewer perceptions of happiness/reassurance. Additionally, they enhanced perceptions of aggression (anger/threat), suggesting that viewers to some extent may be processing and interpreting these facial displays as ambivalent—both positive and negative. Activation of muscular controls of the lower face thus appear to dampen the perceived positivity of the individual displaying the smile with observers likely to perceive mixed emotion.⁹⁰

Contempt smiles

The last type of smile to be considered here is the contempt display. According to Ekman and colleagues, this facial display is composed of a unilateral lip corner pull (AU 12) and tightening of the lip corner (AU 14) and may be characterized as a “controlled half smile.” While there is debate as to whether contempt is a basic emotion, or a blend of distinct emotions, such as happiness and disgust, extensive cross-cultural research shows that contempt displays are reliably associated with situations in which in-group members violate the ethics of a community.^{91,92} Therefore, the contempt smile may be used to signal that a member of the community is tolerated, but not necessarily accepted, by the individual displaying it.

While the objective characterization and measurement of these different smiles are central for understanding the nature of social signaling intent, how observers perceive them determines their communicative impact. We expect that the attribution of emotion by viewers will be affected by specific facial display morphology. Here, enjoyment and amusement smiles should be interpreted as displaying higher levels of happiness/reassurance and lower levels of anger/threat compared to other smile types. Posed smiles will likely be interpreted as less positive, although they may not be recognized for displaying anger/threat if the associated facial muscular movements are not observed. On the

other hand, controlled smiles, in which positive and negative display elements are both clearly present, will likely be interpreted as signaling a mix of associated emotions, albeit in a manner that dampens perceived happiness/reassurance. Finally, contempt smiles will likely be perceived as higher in anger/threat than the other displays.

Candidate facial display behavior

In the analysis that follows, we consider how the smiling behavior of presidential candidates can be characterized in terms of their signal meaning and perceived intent by subjecting them to objective analysis and viewer interpretation. We first code the candidates' smiling behavior using the Facial Action Coding System (FACS) to objectively characterize these displays as distinct smile types (posed, enjoyment, amusement, controlled, and contempt). Next, we report the results of an online study in which perceived candidate emotions were assessed by viewers. We test whether audiences reliably discriminate between different smile types and which smile types are perceived as displaying prototypical emotion.

Objective measures of facial displays

The stimuli used in this study consisted of twenty happiness/reassurance displays, four to ten seconds in length, from Republican Party presidential candidates. The majority of displays were drawn from speeches delivered at the Conservative Political Action Conference, or CPAC, in February 2011. CPAC is an annual event where political players have the opportunity to make comments in front of friendly partisan audiences. For the purposes of research, this televised conference also provides the opportunity to observe political nonverbal behavior from a fixed camera perspective. The use of a single camera facilitates continuous, unimpeded coding during the laughter and applause that immediately follows candidate comments. The 2011 CPAC conference provided the majority of clips for this analysis, supplemented by video clips from CPAC 2010 and other events for Jon Huntsman, who did not take part in either CPAC event, and Rick Santorum, whose lack of happiness/reassurance displays during CPAC appearances required the use of an outside speech.

The clips were selected on the basis of providing close-up (head-and-shoulder) shots of the candidates while they were standing in front of a standardized background in which no other individuals entered into

the frame and in which the candidate exhibited limited body movement. Video clips were further selected for inclusion on the basis of noticeable audience response, typically laughter or applause. Final stimulus materials included one prototypical happiness/reassurance display in the form of an enjoyment or amusement smile and one "mixed emotion" smile, whether a controlled, posed, or contempt smile, from each of the ten candidates. This strategy yielded almost one hundred video clips that met our preliminary criteria but just twenty that were suitable for FACS coding. The final clips were then coded by a FACS-certified coder (PAS).

Findings

The analysis first groups candidate displays into different smile types on the basis of our coding criteria (see Table 2). Because we were limited by the availability of display behavior that conformed with our selection criteria, a perfectly balanced design was not possible. Even here we were less than successful, as Rick Santorum did not display happiness/reassurance behavior during those rare instances when he did elicit laughter or applause that lasted more than five seconds. As a result, we had to use video of Santorum responding to audience questions. Likewise, the one instance in which Ron Paul displayed a smile appropriate for our coding, the smile lasted slightly less than our five-second threshold (4.3 seconds). Despite these constraints, we were still able to find and test an array of different smiles displayed by the 2012 Republican candidates.

Posed smiles

Four Republican candidates were coded as displaying posed smiles: Newt Gingrich, Jon Huntsman, Gary Johnson, and Rick Santorum. Gingrich's expressive display amounted to a slight and fleeting smile that passed his lips, preceded by a brief tongue show (see Figure 1B). Huntsman's smiles, while broad and open, featured a lowered and loosened jaw, and did not engage his *orbicularis oculi* muscles; indeed, there was moderate contraction of the muscles pulling his top lip up, a movement associated with anger and/or disgust. Johnson, for his part, exhibited highly labile facial displays. The muscles of his upper face expressed both surprise, signaled by the raising of both eyelids, as well as anger, with the contraction of his *corrugator* (brow) muscles pulling his eyebrows together. Meanwhile, his lower face briefly displayed the *zygomatic* lip corner pull. However, Johnson's displays were modulated by smile controls multiple times, and he stuck his tongue out

An inventory of political smiles

Table 2. Facial Action Coding System (FACS) smile characterization.

Smile type (video file)	Sec/(freq)	Facial Action Unit (AU)/strength (a-e)/(frames [on-set to off-set])
Posed (CPC10.Gingrich.H/R.13.45)	7.89 (118)	Upper: Lower: 12 (b 57–66) + 19 (c 49–51) + 25 (b47–54; b 66–118) + 26 (b 47–54; b 66–118)
Posed (LBF.Huntsman.H/R.0.17)	5.76 (86)	Upper: Lower: 10 (c 45–86) + 12 (e 4–86) + 25 (b 0–1; c 21–86) + 26 (d 24–43)
Posed (w/tongue) (CPAC.Johnson.H/R.2.26)	5.60 (84)	Upper: 1 (c 7–23) + 2 (c 7–23) + 4 (a 42–84) Lower: 12 (c 69–77) + 14 (b 7–10) + 17 (c 6–15; c 44–48) + 18 (c 78–84) + 19 (b 51–56; b 72–77) + 25 (b 0–2; b 16–21; c 51–84) + 26 (c 0–2; c 16–21; b 37–41; d 51–84)
Posed (CPC10.Santorum.H/R.19.15)	8.36 (125)	Upper: Lower: 12 (d 85–125) + 25 (c 80–84) + 26 (d 80–84)
Enjoyment (CPAC.Perry.H/R.23.28)	7.78 (117)	Upper: 6 (d 4–75) + 7 (d 24–117) Lower: 12 (d 3–99) + 14 (b 115–117) + 18 (b 0–2; c 91–113) + 25 (c 0–113)
Amusement (CPAC.Bachmann.H/R.14.04)	6.57 (99)	Upper: 6 (b 50–99) + 7 (e 44–99) Lower: 10 (b 53–83) + 12 (d 45–84) + 25 (c 52–85) + 26 (b 67–85)
Amusement (w/laughter) (CPAC.Cain.H/R.19.19)	7.52 (113)	Upper: 6 (c 27–87) + 7 (e 40–87) Lower: 12 (e 32–82) + 17 (b 112–113) + 25 (d 0–83) + 26 (c 0–73) + 27 (d 74–77)
Amusement (w/laughter and tongue show) (CPC10.Gingrich.H/R.0.09)	8.24 (124)	Upper: 6 (c 85–124) + 7 (b 6–26; d 51–115) Lower: 12 (e 48–124) + 19 (32–38) + 25 (e 32–124) + 26 (b 32–41; d 89–124)
Amusement (FFC.Huntsman.H/R.2.38)	8.59 (129)	Upper: 1 (d 0–29) + 2 (d 0–29) + 4 (b 0–11) + 6 (a 112–129) Lower: 10 (b 59–129) + 12 (b 68–129) + 14 (b 0–34) + 25 (c 83–129) + 26 (b 101–129)
Amusement (w/tongue show) (CPAC.Pawlenty.H/R.1.01)	5.50 (83)	Upper: 6 (a 0–71) Lower: 12 (e 0–72) + 19 (c 10–13) + 25 (b 0–5; c 9–14; c 23–81) + 26 (b 7–14; d 23–81) + 28 (b 14–23; b 69–83) + 29 (d 15–22)
Amusement (w/laughter and tongue show) (CPAC.Pawlenty.H/R.2.21)	5.60 (84)	Upper: 6 (d 17–84) + 7 (d 35–84) Lower: 12 (e 19–84) + 14 (c 1–20) + 19 (b 11–14) + 24 (b 71–84) + 25 (b 11–17; c 19–70) + 26 (b 9–17; d 19–70) + 29 (b 67–83)
Controlled-enjoyment (CPAC.Bachmann.H/R.30.12)	6.66 (100)	Upper: 7 (b 0–32) Lower: 12 (b 52–60; a 97–100) + 20 (b 53–78) + 24 (b 93–100) + 25 (b 0–11; b 62–91) + 26 (c 0–11; c 81–91)
Controlled-amusement (CPAC.Johnson.H/R.1.21)	6.34 (95)	Upper: 6 (d 13–47) + 7(c 66–95) Lower: 10 (b 12–41; c 60–92) + 12 (e 11–56) + 13 (d 65–92) + 14 (c 2–10) + 17 (e 24–38; d 61–80) + 25 (c 17–23; c 38–59; c 80–95) + 26 (c 17–23; b 38–59; c 62–95)
Controlled-amusement (CPAC.Paul.H/R.0.24)	4.30 (64)	Upper: 6 (b 11–43) Lower: 12 (c 10–38) + 14 (b 4–37) + 17 (d 25–46; b 51–54) + 18 (b 61–64) + 25 (c 0–25; b 46–52; b 55–64) + 26 (b 0–25)
Controlled-amusement (CPAC.Paul.H/R.0.47)	7.36 (110)	Upper: 6 (b 6–101) Lower: 12 (c 1–103) + 17 (c 104–109) + 25 (c 0–103) + 26 (b 17–103)
Controlled-enjoyment (CPAC.Perry.H/R.7.20)	5.57 (84)	Upper: 6 (c 40–84) Lower: 12 (d 37–84) + 17 (d 40–84)
Controlled-posed (CPAC.Romney.H/R.5.12)	10.84 (163)	Upper: Lower: 10 (b 2–8; c 123–156) + 12 (c 23–100) + 17 (b 2–3; b 35–163) + 25 (b 5–10)
Controlled-amusement (CPC10.Santorum.H/R.22.44)	10.61 (159)	Upper: 7 (c 14–43) Lower: 12 (e 6–159) + 17 (e 4–76; e 90–159) + 25 (c 77–90) + 26 (c 78–90)
Contempt (CPAC.Cain.H/R.9.00)	5.27 (79)	Upper: Lower: L12 (d 12–79) + 17 (b 0–8) + 25 (c 7–12) + 26 (b 7–12)
Contempt (CPAC.Romney.H/R.4.28)	7.04 (106)	Upper: Lower: 9 (b 70–104) + L10 (b 11–106) R12 (d 3–106) + 39 (99–104)

Note: H/R = happiness/reassurance display. Additional coding details available from the first author.

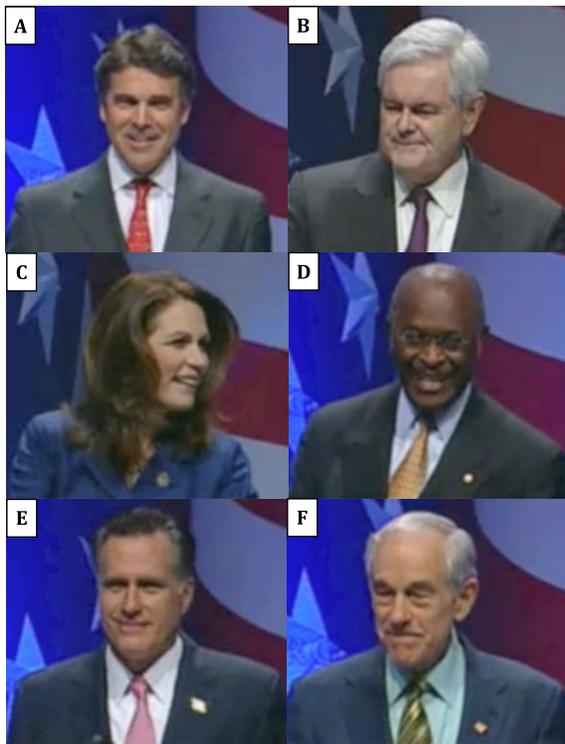


Figure 1. Sample smiles of the 2012 Republican candidates. *Note:* A = Enjoyment smile (R. Perry); B = Posed smile (N. Gingrich); C = Amusement smile (M. Bachmann); D = Amusement smile (H. Cain); E = Contempt smile (M. Romney); F = Controlled smile (R. Paul).

twice during his displays. Finally, Santorum displayed a posed smile, raising his lips strongly and showing his upper teeth without engaging the muscles surrounding his eyes, all the while looking down.

Enjoyment smiles

As defined in the literature, enjoyment smiles occur when the *zygomatic* muscles pull the lip corners up laterally and the eye muscles are engaged, narrowing them; yet the jaw is not dropped in amusement. In our sample of clips, this display was clearly expressed by then-Texas Governor Rick Perry (see Figure 1A), who contracted both muscle groups simultaneously and strongly while nodding slightly. Despite a pool of nearly one hundred video clips meeting our selection criteria, only one true enjoyment smile was found suggesting that, at least in these public performances, such “prototypical” display behavior is rare.

Amusement smiles

In our sample of clips there were six amusement smiles; three were accompanied by candidate laughter. Amusement smiles occurring without laughter included an open-mouth smile by Michelle Bachmann (see Figure 1C), in which she displayed a slight raising of the upper lip. Jon Huntsman likewise displayed an amusement smile with a slight upper lip raise, although this display was preceded by raised and slightly pulled together eyebrows, presumably in surprise. Finally, Tim Pawlenty displayed amusement in his lower face, albeit with only a slight contraction of the muscles surrounding his eyes, and briefly showed his tongue.

Amusement smiles occurring with laughter were expressed by Herman Cain, Newt Gingrich, and Tim Pawlenty. Cain’s amusement display (see Figure 1D), while briefly engaging a smile control (in just two frames), saw him not only drop his jaw slightly but also stretch it wide. Gingrich’s amusement display, in addition to laughter, also evidenced a brief tongue reveal. Finally, Pawlenty engaged in a prototypical amusement and laughter display, albeit with a slight tightening of his lips and a tongue reveal as well. An argument may be made that this was a controlled smile; however, due to laughter by Pawlenty, this was considered an amusement smile for the purpose of this study.

Controlled smiles

Several different controlled smiles were observed in the sample, including controlled posed, controlled enjoyment, and controlled amusement smiles. A controlled posed smile by Mitt Romney featured a *zygomatic* lip corner pull that was controlled or slightly suppressed by lower facial muscle activity, albeit not accompanied by contraction of the *orbicularis oculi* muscle surrounding the eyes. Romney exhibited a moderate-sized smile with his lips closed, pressing upward with his lower lip; concurrently, his upper lip was pulled up during the display by the muscle associated with disgust, the *levator labii*.

Michelle Bachmann’s second happiness/reassurance display, characterized by a very short and slight raise of her lip corners and preceded by a slight narrowing of her eyes, is best described as a controlled enjoyment smile; this was followed with a pull of her lips straight back, as can be seen in submissive behavior, before her smile reappeared briefly to be controlled by tightened lips. Likewise, a controlled enjoyment smile was exhibited by Rick Perry when his lip corners raised and pulled back

and up while his eyes were contracted (albeit with his lower lip pushed up, keeping his lips pressed together throughout the display).

Controlled amusement smiles can be seen in the displays of Gary Johnson, Ron Paul, and Rick Santorum. Johnson's controlled amusement smile, like his other display behavior, is highly variable even within the brief time (less than seven seconds) he took to display it. Here, his amusement smile, which strongly engaged the muscles around his eyes, with lip corner pulls sharply upwards and at an angle (accompanied by multiple openings of the mouth and jaw drops), was controlled by an upward press of his lower lip. Additionally, his upper lip pulled slightly upward during his initial smile, and upward again with moderate intensity during his second (posed) smile.

Both of Paul's happiness/reassurance displays can be considered controlled amusement smiles. Each is marked by slight contraction of the *orbicularis oculi* muscles surrounding the eyes, a moderate raise of his lip corners, and a slight jaw drop while being controlled by his lower lip pressing up (see Figure 1F). However, Paul's first smile was shorter in duration than his second, and his lip corners were contracted slightly during his first smile. Finally, Santorum displayed a strong and sustained amusement smile that was controlled by an upward press of his lower lip twice during his display.

Contempt smiles

Two clearly contemptuous smiles were displayed in our sample of candidate smiles, one apiece by Herman Cain and Mitt Romney. Cain's contempt display was prefaced by a slight jaw drop before the left corner of his lips pulled up into a half smile. Romney's contempt smile (see Figure 1E), on the other hand, pulled the right side of his face into a unilateral smile; during this display he also exhibited signs of disgust through an upward pull of his top lip as well as by wrinkling his nose.

In summary, a range of smiles were observed by candidates in televised appearances before friendly audiences in the run-up to the 2012 presidential election. The variety of muscle movements seen in the smiles analyzed, even those selected for most closely matching existing ethological categorizations of happiness/reassurance, indicates a substantial amount of display variability and differentiation. Furthermore, there are more controlled smiles than other smile types. This may be the result of the selection criteria we used to identify displays for coding; a more likely explanation is that the Republican candidates' reaction to audience

laughter and applause regulated their display behavior so that they did not appear to inappropriately enjoy the audience's attention. The question remains, however, as to whether viewers of political smiles recognize the nuance in smile variation based on observed emotional intent when the displays are shown in isolation, not bracketed by audience laughter or applause. This is the next stage of our analysis.

Viewer perceptions of political smiles

Short video clips of candidate displays, selected on the basis of our conceptual criteria, were next presented to viewers without sound for rating in an online experiment. The clips played automatically upon accessing the study webpage, with each display preceded by a five-second countdown leader. Participants were asked to view each clip and then evaluate the emotional intent of the display through a series of response sliders on the opposite side of the screen. To control for potential recency and primacy effects, the clips were randomly ordered, with each participant assigned to one of three experimental conditions.

Method

Participants. Participants for this phase of the study were drawn from introductory classes at two mid-sized (less than 25,000 students) universities and one community college in the southern United States. A total of 102 students took part in the study in exchange for extra credit, with complete data from 91 participants forming the basis of our analysis. Data collection took place from September 29 to October 7, 2011. The average age of participants was 26.7 years ($SD = 10.43$) with ages ranging from seventeen to sixty. Of those taking part, 73 percent were female, and 89.2 percent were white. Participants were roughly evenly divided between Republican Party identifiers (42 percent) and Independents (40.9 percent), with far fewer Democrats (17.2 percent).

Measures. Viewer assessments of candidate emotion were measured with 0 to 100 point scales using the discrete emotion terms *happy* and *playful* representing "happiness/reassurance" and *angry* and *disgust* to measure a display's degree of "anger/threat," or negative leakage. The scales are based on emotion terms used in the Dartmouth Group's earlier research,⁹³ as well as by Stewart and Dowe in their study of President Obama's smiles and neutral displays.⁹⁴ Perceived strength of the emotion felt by the candidate was also measured with

0 to 100 scales, anchored by the terms “Not at all” (0) and “Extremely” (100). The slider featured a shaded bar that moved from white to grey at the midpoint of the scale, then to black as the slider moved in the direction of “Extremely.”

The emotion terms representing both reassurance (happy and playful) and anger/threat (anger and disgust) were combined into averaged scales and their reliability assessed. Anger and disgust are often conflated or confused with one another in research on the identification of facial displays due to there being similar (yet differing) patterns of appraisal and action tendencies associated with each of these emotions.^{95,96} As a result, we use both of these terms to construct a measure of perceived anger/threat in candidate expressions.

For most smiles, Cronbach’s alpha scores for our emotional response indexes were in the 0.60 to 0.80 range, indicating an acceptable level of reliability (see Appendix Table 1). To control for the potential effect of more recognizable candidates influencing emotion ratings, we asked participants to rank how familiar they were with the candidates on a 100-point scale and then correlated these scores with the emotion ratings of the displays, finding no significant influence of recognizability on ratings.

Candidate familiarity ratings ranged from a high of 31.3 ($SD = 37.0$) for Michelle Bachmann to a low of 11.5 ($SD = 21.7$) for Rick Santorum, with the remainder of the candidates—Newt Gingrich ($M = 27.1, SD = 36.0$), Mitt Romney ($M = 26.4, SD = 33.9$), Rick Perry ($M = 22.5, SD = 32.6$), Herman Cain ($M = 22.3, SD = 32.1$), Gary Johnson ($M = 19.3, SD = 31.9$), Tim Pawlenty ($M = 18.0, SD = 26.2$), Ron Paul ($M = 17.9, SD = 28.3$), and Jon Huntsman ($M = 15.9, SD = 23.6$)—exhibiting relatively low familiarity at the time of data collection. Of the forty correlation coefficients analyzed (ten candidates \times two displays \times two measures), only one was significant—the anger/threat rating for Michelle Bachmann’s controlled felt smile was moderately correlated with participant familiarity ($r = 0.231, p = 0.029$).

Results

To assess participant perceptions of candidate affect, a repeated-measures ANOVA model was used to analyze viewer ratings, with our emotion scales serving as the dependent variables. Party identification, evaluator sex, and presentation order were entered as between-subjects factors. When the model considered differences

in the interpretation of happiness/reassurance displays, a significant departure from sphericity was detected: Mauchly’s $W = 0.005, \chi^2(189) = 376.471, p < 0.001$. The lower-bound ε was used to adjust the degrees of freedom, allowing correction in the evaluation of the F -ratio.

Findings for the adjusted model show a main effect for within-group perceptions of happiness/reassurance, $F(1, 19) = 21.048, p < 0.001$, partial $\eta^2 = 0.213$. Findings for the between-subjects factors of party identification, $F(2, 86) = 2.639, p = 0.078$, partial $\eta^2 = 0.063$, approached significance, while findings for evaluator sex, $F(1, 78) = 0.135, p = \text{ns}$, partial $\eta^2 = 0.002$, and presentation order, $F(2, 78) = 0.265, p = \text{ns}$, partial $\eta^2 = 0.007$, suggest no significant role. The two-way interactions between party identification and treatment condition, as well as party identification by sex, were nonsignificant as well, suggesting no significant influence on the interpretation of the happiness/reassurance displays.

Findings for perceptions of anger/threat (negative leakage) within the displays pointed to another departure from sphericity assumptions (Mauchly’s $W = 0.001, \chi^2(189) = 510.540, p < 0.001$). As a result, we use the conservative lower-bound ε to adjust degrees of freedom. Even with this adjustment, the differences between evaluation of facial displays are significant, $F(1, 19) = 6.654, p = 0.012$, partial $\eta^2 = 0.079$. Main effects for party identification, $F(2, 86) = 0.166, p = \text{ns}$, partial $\eta^2 = 0.004$, and sex, $F(1, 78) = 2.088, p = \text{ns}$, partial $\eta^2 = 0.026$, showed no significant differences, although treatment order approached significance, $F(2, 78) = 2.993, p = 0.056$, partial $\eta^2 = 0.071$.

Analysis of the two-way interactions for the between-subjects factors again revealed no significant differences. This lack of significance for evaluator sex reflects recent findings showing little variation between men and women in the interpretation of facial displays.⁹⁷ The lack of significant differences based upon party identification likely reflects the lack of candidate salience at the time of the study, months before the presidential primaries commenced; alternatively, it may reflect insufficient representation in the sample, since just 17 percent of participants identified as Democrat. Finally, while treatment order might have played a role (at $p < 0.10$) with the order of smile presentation affecting subsequent display interpretation, this could also be a random effect.

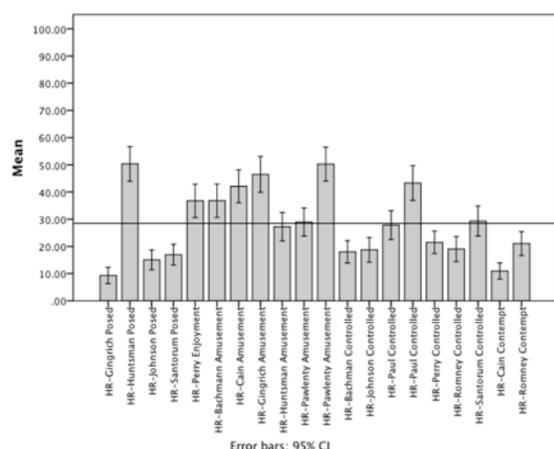


Figure 2. Perceived reassurance in Republican candidate smiles. Note: HR = happiness/reassurance rating.

Posed smiles

Analysis of posed smiles showed they conveyed the least amount of happiness/reassurance (see Figure 2). In terms of negative leakage, posed smiles were seen as near the average of the smiles considered in this study (see Figure 3). Of note, however, are two specific smiles in our sample. First, Newt Gingrich’s posed smile rated significantly lower than almost all smiles in happiness/reassurance and significantly higher in anger/threat when pairwise comparisons were made. (Detailed statistical results are available upon request.) Second, Jon Huntsman’s false smile appeared to resonate with respondents—not as posed but as an enjoyment or amusement smile in terms of having the most happiness/reassurance among all smiles measured. The differences between the two smiles might be seen in the amount of time the lip corners were pulled up and back at an angle (AU 12): Gingrich’s were engaged at minimal levels for a short period of time (see Figure 1B), whereas Huntsman’s lip corners were contracted at the highest level for a comparatively long period of time.

Enjoyment smile

The one enjoyment smile found among the videos meeting our selection criteria was displayed by Rick Perry. This display was rated significantly higher in happiness/reassurance than the majority of smiles considered (see Figure 2). In terms of negative leakage, Perry’s enjoyment smile was evaluated as average when compared to all other smiles, a fact reflected in the relative

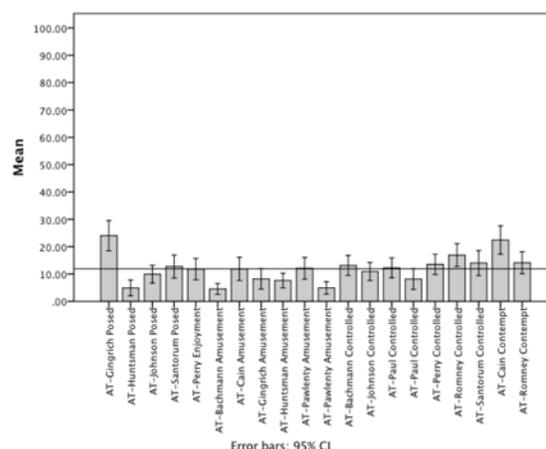


Figure 3. Negative leakage perceived in Republican candidate smiles. Note: AT = anger/threat rating.

lack of significant differences between this smile and other smiles when pairwise comparisons were made.

Amusement smiles

When considering pairwise comparisons of happiness/reassurance ratings, amusement smiles can be subdivided into two categories. The first is a “jaw drop” category, as exhibited by Michelle Bachmann, Jon Huntsman, and Tim Pawlenty’s first display. These displays were seen as conveying higher levels of reassurance than posed, controlled, and contempt smiles. But they were superseded in signaling power by amusement smiles accompanied by laughter. Specifically, the amusement smiles of Herman Cain, Newt Gingrich, and Tim Pawlenty were rated significantly higher in happiness/reassurance than posed, controlled and contempt smiles, or in the case of enjoyment and amusement smiles, as not significantly different. Again, the exception was Jon Huntsman’s amusement smile, which was significantly lower in pairwise comparisons with other amusement smiles (excepting Tim Pawlenty’s first amusement smile).

Analysis of amusement smiles suggests that they were perceived as having less negative leakage than other smile types, with the exception of Pawlenty’s amusement smile (see Figure 3). Pairwise comparisons confirm this observation. The exception was Michelle Bachmann’s amusement smile, which was higher in anger/threat than most controlled and contempt smiles.

Controlled smiles

Controlled smiles, especially controlled posed and controlled enjoyment smiles, were perceived as having much less happiness/reassurance than the average smile rated in this study (see Figure 2). The same was true of contempt smiles. On the other hand, controlled amusement smiles approached, or exceeded, the average level of reassurance perceived by participants.

With the exception of Gary Johnson and Ron Paul's controlled amusement smiles, controlled smiles were evaluated to have more negative leakage than other smiles. However, when pairwise comparisons were made, differences were only significant in comparison with Huntsman's posed smile, Bachmann's amusement smile, and Pawlenty's amusement smile (which was accompanied by laughter). While controlled smiles were evaluated as displaying higher levels of anger/threat, a "floor effect" seems to have applied in most cases, as the majority of smiles were rated very low in negative leakage.

Contempt smiles

As with controlled smiles, contempt smiles received much lower happiness/reassurance ratings than the average of all smiles considered. Cain's contempt smile was rated significantly lower in happiness/reassurance than all enjoyment and amusement smiles, as well as all controlled amusement smiles (and Jon Huntsman's posed smile). Romney's contempt smile likewise exhibited a similar pattern, albeit not as pronounced, and was not significantly different from most other controlled smiles measured.

While contempt smiles were evaluated as signaling higher levels of anger/threat than the average smile (see Figure 2), only Cain's display showed significantly higher levels of anger/threat, with the second most negative leakage among all smiles considered. In pairwise comparisons, Cain's contempt smile received significantly higher anger/threat ratings than most amusement smiles, as well as Huntsman's posed smile and one of Ron Paul's controlled amusement smiles.

Consistent with previous research, we find that participants discriminate between different smile types in their evaluation of both positive emotion and trace amounts of anger/threat, or negative leakage. Display evaluation does not appear to be influenced by evaluator sex or political party identification. By conducting this study early in the electoral process, months before the 2012 Iowa caucuses, we were largely able to avoid the exogenous influence of media priming that might

have altered the interpretation of presidential candidate smiles. This study, however, leaves for another day questions concerning the effect of ascribed candidate status (e.g., frontrunner or challenger) on the interpretation of expressive displays and other nonverbal behavior, a productive line of analysis considered by only a handful of studies.^{98,99}

Exposed to just one channel of nonverbal communication, the visual channel, viewers evaluated posed and contempt smiles, especially those of Newt Gingrich and Herman Cain, lower in happiness/reassurance and higher in anger/threat than enjoyment and amusement smiles. As expected, enjoyment and amusement smiles rated higher in happiness/reassurance than most other smiles. The two candidates whose displays were not significantly different on either measure were New Mexico Governor Gary Johnson and eventual Republican Party nominee Mitt Romney. Both of Romney's smiles were muted in the amount of happiness/reassurance displayed and encoded more anger/threat than the average of the smiles evaluated in this study (see Figure 3).

Discussion

In considering these results, the first substantial finding to note is that presidential candidates exhibit considerable variation in their smiling behavior. We observed and coded examples of posed, enjoyment, amusement, controlled, and contempt smiles using the Facial Action Coding System (FACS). Furthermore, variants of amusement smiles co-occurring with laughter were coded for Herman Cain, Newt Gingrich, and Tim Pawlenty and were rated higher in happiness/reassurance than other smiles. However, as largely controlled display behavior occurring in competitive contexts, each of these observed smiles varied in some important way from the theorized prototypical displays by not closely matching defined expectations concerning facial muscular movements.

Another noteworthy finding is that study participants reliably differentiated between types of smiles displayed by the candidates. Not only can happiness/reassurance displays be disaggregated into different smile types, but even minor differences in facial display behavior can influence the interpretation of the emotions they are signaling. While controlled smiles diminish viewer perceptions of affiliative intent, with lower happiness/reassurance and higher anger/threat ratings than enjoyment and amusement smiles, the signaling capacity of amusement smiles appears to

enhance perceptions of affiliative intent while lowering perceived threat. Taken together, these findings most closely match the expectations of the Componential Processing Model of emotional appraisal in which the variability of the display reflects the complexity of the social situation interacting with the candidate's emotional style.

A key factor not systematically considered here was the social context in which the candidate displays occurred,^{100,101} a tradeoff made in exchange for standardizing the type of event the video clips were drawn from. Even though we were able to detect differences in viewer perceptions of candidate displays without contextual cues, contextual factors likely accentuate the signal power of different smile types. The CPAC meeting and other appearances from which the stimulus materials were drawn were all boisterous events in which those present in the auditorium were free to laugh, applaud, or express disapproval at candidate comments (see [Appendix](#)). The use of facial displays to punctuate applause and laugh lines is apparent here, suggesting congruity between the type of smile expressed and perceived intent of a candidate's comments.

In our sample, posed and contempt smiles were associated with verbal attacks on the opposition, namely President Obama. The one case in which this did not appear to occur was after an utterance in Cantonese by Jon Huntsman to a group of international students; however, Huntsman's display is perceived as indicating more happiness/reassurance and less anger/threat than other posed and contempt smiles. Enjoyment and amusement smiles tended to occur in response to audience applause and laughter after statements that were laudatory toward the in-group, namely, the Republican Party. In the one instance in which this was not the case, Michelle Bachmann made an off-color remark concerning Chinese President Hu.

Finally, controlled smiles tended to occur mainly in response to audience applause for substantive talking points by the candidates, suggesting they appreciated the plaudits but did not want to grandstand. However, it is important to note that both Ron Paul's smiles took the form of controlled amusement smiles, one in response to comments regarding support for his libertarian principles and the other for his son Rand Paul being elected Senator for Kentucky. By contrast, Rick Santorum's controlled amusement smile was in response to an audience member's assertion that Congress be treated in the same manner as the general public, not in response to audience applause or laughter.

The relationship between the context of events and quality of candidate displays should be systematically investigated in follow-up research, especially since it appears that facial display behavior in response to comments eliciting laughter and applause "punctuate" the comment, presumably indicating intent.^{102,103} Content analysis of a wide spectrum of communication contexts, including campaign debates, televised speeches and policy addresses, candidate forums, and other appearances, would show the degree to which the facial displays examined here provide reliable signals of candidate intent.

Conclusion

This study has analyzed the smiling behavior of Republican presidential candidates to better understand the variability of political expressive displays and how these displays are perceived by viewers. Close examination of candidate affect provides insight into televised leader display behavior as well as the variability in political nonverbal communication. Findings suggest that our evidence coheres with the Componential Processing Model, as we observed considerable variation in smiles displayed and the displays appeared to reflect the signaling intent of the candidate's comments.

While a range of emotional signals, including aggression and threat, are important for challengers to employ in pursuing their strategic goals, reassurance plays a more central role in leadership than commonly acknowledged. Specifically, the legitimacy necessary for effective leadership is not imposed through coercive practices by leaders but is *granted by followers* to those deemed worthy of support. While political scientists have long been aware of the need for presidents to have the "power to persuade,"¹⁰⁴ more recent research has suggested that the ability to engender freely given support from followers is a core component of leadership.^{105,106,107} And when vying for political power, the ability to communicate nonverbally—particularly through expressive facial displays, including the smiles studied here—is a key attribute that leaders must prioritize¹⁰⁸ and that followers intuitively reward.

By aligning key insights of the Dartmouth Group with recent advances in social signaling analysis, the approach taken here highlights a fruitful avenue for advancing our understanding of political nonverbal behavior. Multiple avenues of inquiry, such as the influence of candidate personality and display context, remain open for investigation. The expressive displays

of the candidates studied here tended to provide specific patterns of nonverbal cues when coded at the microlevel. While this might reflect the fact that these speeches were given in front of partisan audiences, anecdotally, these behaviors appear to reflect enduring tendencies or personality traits.^{109,110} For instance, Mitt Romney, the 2012 Republican Party presidential nominee, had a difficult time emotionally connecting with the voting public, in part due to his inability to comfortably display the enjoyment and amusement smiles necessary to reassure supporters, to win over undecideds, and to motivate party loyalists. Future research might assess candidate display behavior in a range of different contexts and at different points in the campaign to ascertain the connection between expressive displays, authenticity, and display setting, particularly the extent to which subtle nonverbal cues influence observers outside the range of conscious awareness (i.e., physiologically). Taken together, such a multimodal approach may provide greater insight into political leadership, the capacity of candidates to connect with voters, and the level of trust we have in them.

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Appendix

Rhetorical context of candidate smiles

With the various smiles of the Republican Party presidential candidates serving as a kind of nonverbal “punctuation” providing social information about what was just said as well as visual reaction to audience response, the context surrounding candidate displays becomes an important consideration. Therefore, in this appendix we consider the comments made by the candidates and the audience’s response in relation to the type of smile displayed (see Appendix Table 1).

Posed smiles

Before the four posed smiles displayed by Newt Gingrich, Jon Huntsman, Gary Johnson, and Rick Santorum, two of the comments made by the candidates directly attacked President Obama, with Gingrich mocking him through the use of “fast-talking” to attack his supposed flip-flopping on an issue, a common Republican trope,¹¹¹ then deriding Obama’s use of teleprompters—a comment that elicited audience laughter. Santorum, for his part, took Obama to task for his comments in the previous election concerning rural America’s clinging to their guns and religion in times of difficulty, with the audience applauding in response. Johnson’s comment reflected his fiscal conservatism and ability to be elected in a predominantly Democratic state; a corresponding eyebrow raise (signifying surprise) was congruent with his statement. Finally, Huntsman’s speech was to a student group prior to his electoral bid, and by way of introduction to this group he spoke in Cantonese and elicited audience laughter, which likely accounts for his broad smile and the perceived happiness/reassurance it signaled to participants in this study (although the lack of upper face movement is unexpected, especially considering it was difficult to find Huntsman displaying either neutral or anger displays in the video segments considered).

Enjoyment smiles

Rick Perry’s enjoyment smile came in response to audience acclaim for his record in Texas, which he introduced with a self-deprecatory comment concerning his academic background as an animal science major at Texas A&M before making the connection between his approach and that used by the governors of New Jersey and Virginia (Chris Christie and Bob McDonnell). These comments, which reflected positively on

Christie, a national figure for the Republican Party, and McDonnell, who won his race by a seventeen-point margin, may be seen as an attempt by Perry to associate himself with high status in-group members, particularly movers and shakers in the Republican Party.

Amusement smiles

Of the three amusement smiles analyzed, two (by Herman Cain and Newt Gingrich) were accompanied by speaker laughter in response to audience applause. Cain’s was in response to a comment concerning his ability to run for office, whereas Gingrich smiled when he was met by thunderous applause while waiting to speak. Tim Pawlenty’s somewhat incongruous amusement smile (with laughter) came in response to audience applause for a comment about the supposed inefficiency of Obama’s health care program. Likewise, Michelle Bachmann’s amusement smile came after she commented about America’s financial debt to China, with a punchline playing off of an innuendo regarding Chinese President Hu Jintao’s name. Finally, the amusement smiles displayed by Jon Huntsman and Tim Pawlenty in response to audience applause may be seen as reflecting their pleasure at in-group connection, with Huntsman telling a religiously themed story about his adoptive daughter and Pawlenty commending a group of College Republicans for their commitment in driving twenty hours to the CPAC meeting.

Controlled smiles

Of the controlled smiles analyzed, Ron Paul’s first controlled amusement smile likely reflected his delight at the level of support (indicated by audience applause) for his once-eccentric Libertarian positions, while his second controlled amusement smile reflected audience support for his then newly elected senator son, Rand Paul. Likewise, Gary Johnson and Rick Santorum’s controlled amusement smiles likely controlled their delight, with Johnson responding to applause for his management style as New Mexico governor and Santorum reacting to an audience member’s suggestion for annual IRS audits for members of Congress.

Other controlled smiles, whether Bachmann or Perry’s controlled enjoyment or Romney’s controlled posed smiles, seem to reflect candidate enthusiasm over applause for out-group attacks on Obama administration policies. Bachmann’s controlled enjoyment smile came in the wake of her verbal assault on Obamacare and her proposal for a market-based national health care approach, ending with her exclaiming, “The free

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market works—let it!” Perry, meanwhile, attacked the progressive movement for being controlled by “labor unions and activist judges,” whereas Romney attacked President Obama for a cabinet shake-up that he did not perceive as changing much, comparing it with classic film comedy, “Groundhog Day.”

Contempt smiles

The two contempt smiles displayed by Cain and Romney can be seen as directly punctuating their

attacks on nonconservatives and President Obama, respectively. Cain assailed non-right-wing thinking by suggesting that voters educate themselves and become teachers of “the stupid” by coming to conferences like CPAC and visiting his campaign website, whereas Romney attacked Obama for purportedly changing his political philosophy, not just becoming “new and improved.” In both cases, attacks were made on individuals that could be considered mainstream, but outside the sphere of “right-thinkers.”

Table 1. Candidate comments and audience response.

Smile type (video file)	H/R Cronbach	A/T Cronbach	Audience response	Comment preceding smile
Posed (CPAC.Gingrich.H/R.13.45)	0.746	0.757	Laughter/ applause	The Congress should pass him based on Texas and other reforms the strongest possible tort reform bill and let him become President No by explaining he didn't actually mean what he said because if he said what he said he wouldn't have actually meant it because he couldn't actually mean it because that's why he needed a trial lawyer so that we should have understood the action by something else he forgot to say cause the teleprompter wasn't working at that moment and that's not his fault.
Posed (LBF.Huntsman.H/R.0.17)	0.746	0.845	Laughter/ applause	[Speaking in Cantonese]
Posed (CPAC.Johnson.H/R.2.26)	0.688	0.636	Applause	And I would like to think the fact that I got reelected in a state that was 2 to 1 Democrat by saying no to billions of dollars of new spending really just speaks volumes to the fact that people really appreciate good stewardship of tax dollars.
Posed (CPAC10.Santorum.H/R.19.15)	0.674	0.771	Applause	... so let me put my words in language that us bitter folks who cling to our guns and religion can understand.
Enjoyment (CPAC.Perry.H/R.23.28)	0.770	0.765	Laughter	It is simple. Jim, I said, listen, I'm just an animal science major from little Texas A&M, but I get it when it comes to governing. Keep your taxes low—have a light burden on your taxation. Have a regulatory climate that is fair and predictable. A legal system that doesn't allow for junk lawsuits, frivolous lawsuits. And finally, introduce accountability into your public schools so your young people are ready, and of that skilled workforce when they get out [applause and Perry laughter]. My fellow Republican governors in Virginia and New Jersey are following, not what you said (laughter), but those governors understand. . .
Amusement (CPAC.Bachmann.H/R.14.04)	0.852	0.547	Applause	There is one figure who is not worried about this high level of debt accumulation. And that you might say are our friendly Chinese bankers. They're not worried about this. You may know the president of China is named Hu, his name is President Hu, and with all the money we owe China, I think we might rightly say, Hu's your daddy.

Table 1. (Continued)

Smile type (video file)	H/R Cronbach	A/T Cronbach	Audience response	Comment preceding smile
Amusement (w/laughter) (CPAC.Cain.H/R.19.19)	0.763	0.816	Applause	Do what you can do. Not everybody can run for office. Not everybody is in a position to consider running for President. . . . I'm Just saying , I'm just saying (applause).
Amusement (w/laughter) (CPAC.2010.Gingrich.H/R.0.09)	0.749	0.843	Applause	(None—walked on stage to applause).
Amusement (FFC.Huntsman.H/R.2.38)	0.751	0.532	Applause	Gracie loves to tell that story and when asked who found her in the vegetable market, she simply replies, Jesus.
Amusement (CPAC.Pawlenty.H/R.1.01)	0.625	0.660	Applause	These guys drove over 20 hours in a bus to be here to CPAC. So, thanks for coming to all the CRs.
Amusement (w/laughter) (CPAC.Pawlenty.H/R.2.21)	0.645	0.344	Applause/ laughter	And on what planet do they make health care better by putting the bureaucrats in charge?
Controlled-enjoyment (CPAC.Bachmann.H/R.30.12)	0.646	0.679	Applause	And then allow all of us to buy any health care policy we want anywhere in the United States with no minimum mandates. You do that, that attacks the root problem of health care, which are the cost drivers. Free markets work! Let them!
Controlled-amusement (CPAC.Johnson.H/R.1.21)	0.674	0.389	Applause	Well, I got elected and I would like to think it was based upon what I had to say, which was I was going to run the state government like a business. Best product, best service, lowest price. That everything was going to be a cost-benefit analysis. What are we spending, and what are we getting for the money we are spending?
Controlled-amusement (CPAC.Paul.H/R.0.24)	0.723	0.740	Applause	I'm glad to see the revolution is continuing!
Controlled-amusement (CPAC.Paul.H/R.0.47)	0.810	0.874	Applause	But I do want to take a moment to take a little special privilege to say, we had a new senator from Kentucky, and we like that too!
Controlled-enjoyment (CPAC.Perry.H/R.7.20)	0.619	0.636	Light applause	Americans are obviously fed up with the so-called Progressive movement. The, the very, I . . . I'll tell you long ago set aside the people's interest in favor of expanding government and raising taxes while doing the bidding of labor unions and activist judges.
Controlled-posed (CPAC.Romney.H/R.5.12)	0.790	0.657	Laughter/ applause	He replaced his Chicago politician chief of staff with a fresh face. . . from Chicago, named Daley. Make no mistake here folks. What we're watching is not <i>Brave New World</i> , what we're watching is <i>Groundhog Day</i> .
Controlled-amusement (CPAC10.Santorum.H/R.22.44)	0.693	0.702	Applause	Why not have every member of Congress submit to an IRS audit every year to be audited by the same people that audit us.
Contempt (CPAC.Cain.H/R.9.00)	0.580	0.643	Laughter/ applause	You've got to become teachers and educatures, cators, educators of the stupid. [laughter] But you have to stay informed. That's why you come to great conferences like this. That's why you go to HermanCain.com for inna.. information!
Contempt (CPAC.Romney.H/R.4.28)	0.693	0.705	Laughter/ applause	Now what we were hearing was not just a new and improved Barack Obama. It was an entirely different Barack Obama. Saul Alinsky, he was out. Jeffrey Immelt, he was in. The President went from "Change you can believe in" to "Can you believe this change?"